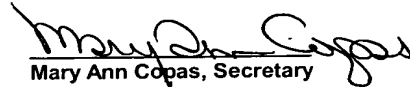


IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Mary Ann Copas, Secretary

Appl. No. : 09/856,342
Applicant : Hermann Brüggendick et al
Filed : August 22, 2001
For : METHOD OF BURNING A NITROGEN CONTAINING FUEL
TC/A.U. : 3749
Examiner : Josiah Cocks

Customer No: 30996

Board of Patent Appeals and Interferences
PO Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF IN RESPONSE TO EXAMINER'S ANSWER OF 08/16/2006

Dear Sir:

In response to the Examiner's Answer, Appellants provide the following comments.

REMARKS/ARGUMENTS

The present invention, as recited in claim 7, defines a method of burning a nitrogen-containing fuel while reducing the emission of nitrogen oxides. As defined specifically in claim 7, the inventive method includes the steps of producing a ***sub-stoichiometric primary zone in the form of a flame core from all of the fuel and primary air***, and ***supplying the flame core with a nitrogen oxide reducing agent so that the reducing agent is distributed within the flame core***, wherein the reducing agent is a nitrogen compound or a hydrocarbon.

In the Examiner's Answer, the Examiner maintains that the Leikert reference discloses "flame zones (7 and 8)" that "form an interior flame, which is surrounded by the outer flame zone (9)". The Examiner goes on to argue that neither the Appellants' specification nor the prior art prohibit a flame core from having multiple zones.

The Appellants respectfully submit that the Examiner's analysis directly contradicts the specification teachings of Leikert et al. Again, claim 7 of the present application specifically defines supplying the sub-stoichiometric primary zone with a nitrogen oxide reducing agent. Leikert specifically teaches a primary flame zone 7, to which a primary fuel (coal dust) and combustion air are fed. In addition, Leikert discloses that a reducing agent is introduced into its secondary flame zone 8, ***not*** its primary flame zone 7.

The Examiner argues further on page 7 of the Answer that the Appellants' specification, or common understanding, does not require that a flame core must have a uniform air to fuel ratio, so that the flame zones (7 and 8) of Leikert, which have different air to fuel ratios, must be considered "separate and different" zones, i.e., not a flame core.

Again, the Examiner's analysis is inaccurate. The Leikert reference *itself unambiguously* discloses that its secondary zone 8 is **separate and different** from its primary flame zone 7. *No where* in the Leikert reference is it disclosed that these two zones 7, 8 comprise a flame core; rather, Leikert actually teaches away from this concept by disclosing that its reducing agent is not introduced into its primary flame zone 7 but, instead, is introduced around this primary flame zone.

As explained in the Appellants' brief, the Leikert arrangement is an example of the conventional "fuel staging" approach to NO_x reduction; that is, the Leikert arrangement introduces the reducing agent into a reduction zone that is located downstream of its burner zone, and a remainder portion of the fuel is added at the reduction zone, that is, the fuel itself serves both as a fuel and a reducing agent.

Contrary to the Examiner's further arguments on page 7 of the Answer, if the Leikert arrangement were operated as asserted by the Examiner to distribute its reducing agent into its primary flame zone 7 instead of introducing its reducing agent into the secondary zone 8 around the primary flame zone 7, the air to fuel ratio within the secondary zone 8 would be practically the same as the air to fuel ratio within the primary flame zone 7 and there would be no demarcation between the secondary zone 8 and the primary flame zone 7. This clearly would contradict the specific disclosure of Leikert, which **requires** this demarcation in order to carry out the method.

Leikert's method provides the steps of producing a sub-stoichiometric primary zone 7 in the form of a flame core and also injecting a reduction fuel at a secondary fuel zone 8 **outside** of the primary flame zone 7.

In addition to this significant and patentable difference relating to the flame core, Leikert clearly discloses that the NO_x reducing agent - i.e., the staged fuel - must be introduced through the nozzles 4 to be burned in the secondary zone 8.

In contrast, in the present invention, the reducing agent is not burned at the location in which it is introduced (the sub-stoichiometric primary zone in the form of a flame core) by reason of a lack of oxygen in this sub-stoichiometric primary zone. Rather, the reducing agent introduced in the present invention reacts directly with the nitrogen oxides within this sub-stoichiometric primary zone.

Again, in contrast to the present invention, Leikert teaches that the NO_x is produced in the primary flame zone before the thus-produced NO_x is then reduced in the secondary flame zone.

Again, in contrast, in the present invention as recited in claim 7, the NO_x reducing agent is introduced directly into the primary zone - that is, the flame core at which the combustion fuel and the primary air are fed – so that the NO_x reducing agent is distributed in the flame core. Claim 7 does not define any “intermediate” zone, as required by Leikert.

As the Examiner states himself on page 9 of the Answer, Leikert discloses “adding reduction fuel from nozzles (4) to ***the flame core via flame zone (8)***”.

Thus, the Examiner here actually supports the Appellant's position that the flame core is separate and different from the “flame zone (8)” AND that the reduction fuel is NOT fed *directly* into the flame core, but passes to the flame core “via” the flame zone 8.

Thus, Leikert is not an appropriate reference either under MPEP section 2131, which indicates that to anticipate a claim a reference must teach every element of the claim in as complete detail as is contained in Applicant's claim, or under MPEP section 2143.03, since not all of Applicant's claim limitations are taught or suggested.

With regard to the rejection of claim 7 under 35 U.S.C. 103(a) over the combination of Leikert and Vier, again the Examiner's argument is based on the flawed

analysis that Leikert's zones 7 and 8 comprise a "flame core" in the sense of the present invention. For the reasons set forth above and in the Appellants' Brief, this is clearly not the case, as the Examiner's analysis contradicts the clear teachings of Leikert in this regard.

Throughout prosecution of this application, the Examiner relied on Vier **ONLY** to show that the person of ordinary skill in the art "would recognize that the coat dust used as the reducing agent in Leikert would include nitrogen and as evidence that a natural gas would be a type of burnable gas identified in Leikert" (see Examiner's Answer, page 9).

Now, however, on page 8 of the Answer, the Examiner seems to be taking the position that Vier also supports the Examiner's position regarding a flame core having multiple, distinct zones. This point was not raised in the Examiner's earlier arguments.

In any event, it is irrelevant whether Vier also teaches multiple zones, when Leikert provides a clear disclosure of a primary zone 7 and second zone 8 and provides NO suggestion that these two zones together form a flame core in the sense of the present invention. Modifying Leikert to contradict its own teachings constitutes impermissible hindsight.

Again, Vier would not lead one of skill in the art to completely modify the Leikert arrangement, ***without ANY suggestion from the Leikert reference itself***, and introduce a reducing agent into Leikert primary flame zone 7 instead of its secondary flame zone 8. Once again, this analysis contradicts the clear teachings of Leikert that the reducing agent is introduced into a secondary flame zone 8; under the Examiner's analysis, in which flame zones 7 and 8 together form the "flame core", the reducing agent then would be introduced into *both zones 7 and 8*, again, contradicting Leikert AND changing the operation of the Leikert method.

It is respectfully submitted that since the prior art does not suggest the desirability of the claimed invention, such art cannot establish a prima facie case of obviousness as clearly set forth in MPEP section 2143.01. Please note also that the modification proposed by the Examiner would change the principle of operation of the prior art, so that also for this reason the references are not sufficient to render the claims prima facie obvious (see the last paragraph of the aforementioned MPEP section 2143.01).

In view of the foregoing discussion, Appellants again respectfully request that the Honorable Board of Patent Appeals and Interferences overrule the final rejection of claims 7-9, 11, 12, and 16-19 over the cited art and hold Appellants' claims to be allowable over such art.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Robert W. Becker".

Robert W. Becker, Reg. No. 26,255
for applicant(s)

ROBERT W. BECKER & ASSOCIATES
707 State Hwy 333, Suite B
Tijeras, NM 87059

Telephone: (505) 286-3511
Facsimile: (505) 286-3524

RWB:mac